LV · No. 5 SEPTEMBER-OCTOBER, 1952

ANIMAL KINGDOM

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ANIMAL KINGDOM

Bulletin of the New York Zoological Society

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Issued bi-monthly at the Offices of the New York Zoological Society, 30 East Fortieth Street, New York 16, N. Y. Editorial and Subscription Offices, Zoological Park, Bronx Park, New York 60, N. Y. Title registered with United States Patent Office • Subscription, $3.50 a year; single copy, 60 cents. Same rates for all foreign countries and Canada. All pictures not otherwise credited are from the photographic collection of the New York Zoological Society.

Wilderness

THERE ARE ESSENCES in human life which defy analysis. Who can measure the influence upon the human spirit of an inspiring passage of music or of a radiant line of poetry or prose? The inner being of man is forever something apart from utilitarian or material influences. The story of Christ going into the wilderness has been accepted through the ages not merely as a symbol but as an essential episode in the personality of an individual. "I will lift up mine eyes unto the hills from whence cometh my help" is a prayer flowing naturally from the human heart that senses the oneness of the individual and the natural world.

Our era is one of pressures from without. There is nothing startling in this – it is the way of man, indeed of all life. Faiths have always required defense as have all precious things. Among the latter is *"wilderness"*. We in America still possess such regions, a diminishing few – sanctuaries where even the wildest creatures are quiet and at home.

Let's not let them disappear – they give strength to those who go to them, and always will.

Fairfield Osborn

THE TURQUOISE TAPIR OF TOTONICAPAN

By JOCELYN CRANE

EVER SINCE some particular caveman started the first sketch of a local beast on a rocky wall, human beings have been trying to draw a horse. Or a cow. Or to make a lion out of butter or a dog out of soap. Once I watched a girl fashion a rather attractive amoeba from platinum. Mohammedans, almost alone, have never been allowed that kind of fun; they believe that anyone who makes an image of an animal will, come Judgment Day, be called upon to give the creature a soul. But almost all the rest of us have at some stage felt the way Rosa Bonheur obviously felt all her life — excited, and often exasperated, and, throughout, full of affection for our subjects. Most of us, however, recover nicely from that particular artistic ambition by the time we have finished with the whooping cough.

We never, however, outgrow our national fondness for animals. From childhood we are accustomed to healthy pets, humane zoos and national parks full of saucy bears; as a result, a love of living creatures is as natural as animal crackers. Nowadays, if we have no youngsters to take to the Children's Zoo, we go anyway, against the rules and not even sheepishly. We duck under the Pony Bridge, talk openly with Deacon-the-Crow, and end by patting a llama on the nose.

Often it seems that the warmth of other nationalities toward their animals is a sort of index of our spontaneous sympathy with them as a people. Regardless of their century, gods or government, it applies to all kindred spirits from the old Chinese painters of herons to Gilbert White and his book about Selborne. Even before I went to Guatemala this summer, I had always had a friendly feeling for her people: it seemed that they must be specially *simpática* since they dot their blouses with flowers and birds, and scatter the quetzal, their national bird of freedom,

on everything possible from blankets to stamps. According to legend, quetzals die in captivity, which is why Guatemala's founding fathers adopted the symbol in the first place; the fact that the fabulous birds live so well in the Bronx Zoo seems to afford further evidence of basic Guatemalan-North American affinity!

For years in Latin America we in the Department of Tropical Research have had fun watching for just these things, for the place of animals — especially wild ones — in the lives of the people, and in their arts and crafts. Any youngster in the hot lowlands may have a peccary or a monkey for a pet. If, however, his elders take the time and thought to use such a creature in a design, something more than a child's love of pets is indicated. Those are the signs we watch for, at odd moments in our travels.

In the old days, of course, before the conquest, jungle animals played an important part in religion and symbolism, a part which has now largely vanished, save for a few exceptions like the quetzal. We all remember, at least from pictures, jaguars of stone and jade from ancient Mayan tombs. Probably most of us city children were conscientiously exposed, about the age of 10 or 12, to the actual treasures in museums, perhaps on alternate Saturdays to our visits with live jaguars in the Zoo.

Much more attractive than those squarish and toothy forms are the small golden ornaments and charms. In one collection in Bogotá — so precious the shining things are kept locked up in a bank vault — I counted nine kinds of animals among the little figures of gods and men. There were fish, frogs, snakes, an iguana, a crocodile swallowing a man, a harpy eagle, curassows, a toucan sleeping properly with his tail over his back, and a monkey. There was even a necklace of golden cicada nymphs. Like the stone jaguars of the north, these *huacas* were probably fashioned long before the conquest; it was objects like them that led the Spaniards on to further search for treasure.

Nowadays, with so many of the tropical forests destroyed, it is hard to find the old jungle motifs in any post-conquest design. When we do find a bird that isn't a mere chicken, we feel as happy as a hunter for pirate treasure with a genuine gold doubloon.

Once we were in Salvador during the Christmas market. Dr. Beebe has written of that day: "Here were thousands upon thousands of tiny clay images, all made by hand, from minute beings less than an inch long to three-foot dragon creatures born of untrammeled imagination . . . armadillos, guinea hens, vultures, squirrels, soldiers, clowns, saints and washerwomen. . . . Local color was occasionally introduced into the diminutive Noël crêches, and often in place of the attendant burros and cows there were realistic spoonbills, zopilotes and armadillos. It was easy to visualize and excuse the workings of the Indian mind . . . in unconsciously populating the villages of Palestine with unmistakable neotropical fauna."*

In Latin American churches, animal motifs are almost as rare as in Mohammedan mosques, except of course for a few inevitable lambs. But once in Colombia I had wonderful luck. It was on a hot noon in Cali, where we were waiting for space on a south-bound plane. We wandered thankfully into the cool dimness of the ancient church of La Merced. By the altar was a figure of the Virgin. As our eyes grew used to the light, we saw that her robes were scarlet and blue, splashed with gold, and her baby had rosy cheeks. Altogether she looked cheerful, placid and well-adjusted.

Then the priest told us her story. She did not always live there. Long ago, she was brought to this highland church from a jungle valley near the sea. Several times she unceremoniously vanished to her original niche, and had to be brought back. Finally, to help her feel at home, an understanding *padre* painted her new altar with jungle scenes, and among these she has lived happily ever after. And there around her we saw the paintings: great tropical trees, complete with buttress and lianas, airplants and blossoms. There were birds, too, including an unmistakable scarlet macaw, a king vulture, and another bird which looked very much like a cock-of-the-rock.

Both the Salvador market animals and the Colombian Virgin's private jungle we found by accident. With the turquoise tapir in Guatemala it was different. I was looking for him, and, one way and another, it was quite a hunt. I was having a busman's holiday on the way home from

* "Book of Bays," p. 143.

our Trinidad station, and had stopped off in Guatemala to work with fiddler crabs in the mud of the Atlantic coast. After that, there remained two precious days, completely free, before my plane left for home. There would be just time for a short trip to the highlands, to the heart of Guatemala, where the Indians have Mayan blood, chatter in ancient dialects, and wear brilliant homespuns for everyday.

craves a burst of outrageous color — a blaze of magenta and orange, even, absolutely side by side. Highland Guatemala was, by all accounts, the place to find it.

The tapir hunt started in the archaeological museum in Guatemala City. I had passed several hours in that beautiful and stimulating place, admiring the treasures from the Mayan ruins, making notes in the garden patio, and, finally,

Always, after any muddy session with fiddler crabs, a colorful postscript is welcome. The crabs do their best to spruce up their environment by waving shining claws of pink or white. But they thrive only in desolate wastes of drab mud and olive-green mangroves. Even a tropical mangrove sky, during the best season for fiddler-study, is either dark with rain or a merely wishy-washy blue. After days of that scenery, the human spirit

trying to memorize a few of the principal textile designs from the various highland regions. I had just about decided to spend those two free days in Chichicastenango when a white cotton blouse, a typical *huipil,* caught my eyes in a case by itself. Like all these old-style Guatemalan blouses, it was in pattern simply a length of cloth with a hole for the head. Around the neck, yoke fashion, were four wide bands of solid embroi-

dery, a rich design of plum purple, turquoise-green and magenta, all accented with yellow and black and assembled with taste and skill.

But the subject was the prize. A whole jungleful of animals paraded round and round, among a luxuriant display of Monstera leaves, pond lilies and, perhaps, tropical passionflowers. There were black spider monkeys with magenta eyes, cavorting yellow deer, alert rabbits in plum, and a somewhat questionable anteater. There were herons too, one of which was molting his tail-feathers, and an assortment of ducks. There was even a pride of old-world lions, full-maned and rampant, which certainly never prowled a Guatemalan forest, and some similarly outré peacocks. Finally, nicely spaced, were four creatures in turquoise which seemed the most appealing of all. They had the short legs and curved snouts of that prehistoric-looking beast, the tapir, and they sat absurdly back on their haunches, as real-life tapirs will. In spite of the glass case and the blue-green floss, it was easy to imagine a swampy wallow around them, and almost to smell the tapir odor – half horsey, half unique.

When Señorita Martinez of the museum staff told me this blouse was at least forty years old, I at once decided how to spend my holiday. It would be a hunt for people who might, even now, be making turquoise tapirs. Such folk, if they still lived, must love wild animals to do them so well. The señorita warned me, however, not to expect too much; today's work she said, whatever the subject, was usually far more hasty and garish than the pieces of long ago.

On the label the blouse's place of origin was

vas this section of a white cotton blouse in a seum in Guatemala City that started Miss Crane her search for the creator of the "turquoise ta-" This embroidered huipil is about 40 years old.

clear: the Department of Totonicapán. Unfortunately, in my final hasty note-taking near the museum's closing hour, I omitted some small-type geographical details. It turned out that these would have been most helpful next day, when I found out how many mountains Totonicapán contained.

When hunted up on the map, the region proved to be high in the midst of the Maya-Quiché country, which, even today, is considered the artistic center of the republic. But the strange riddle was why temperate-zone mountaineers should embroider tapirs and monkeys, which, in Guatemala, live way down in the tropical jungles. A second problem was how these Indians should be on such apparently intimate terms with lions and peacocks.

Answers to both these questions turned up before I ever reached the highlands. It seems that mountain people in this country yearly migrate down to the lowlands to work on the coffee fincas. There they can, or could – the forty years ago *the* blouse was made – easily find models for their *tierra caliente* animals.

The alien peacocks and lions were explained as simply. The conquerors brought in the peafowl, which are now not at all rare in the country. As far as the lions are concerned, people have loved zoos and circuses throughout history. In Guatemala's zoo, near the museum, I saw what could have been the origin of the artist's lions. Two Indian country women, no doubt in for market, and a small girl marched single file through the gates and swerved straight over to the lion's cage nearby. Each, including the youngster, carried a basket on her head and wore full Indian dress. They stayed there five minutes, pointing and chattering. Then they turned suddenly and marched out again, looking pleased and not wasting a glance on the local monkeys.

The next morning a plane flew me to Quezaltenango, in the heart of the highland country. Although the same journey would have taken the conquistadores dangerous weeks, we made it, past blue Atitlán and assorted smooth volcanoes, in just thirty minutes. The capital of Totonicapán, where, I hoped, people still embroidered turquoise tapirs, lay only an hour or so from Quezaltenango.

The bus was jammed that afternoon with Indians on the way home from market. Even at the end of a wearing day they were cheerful and clean. The only dirty face in sight belonged to a little boy, who was one of my four seat-mates, the others being his mother, his nursing baby sister, and a small and immaculate pig. The only smells detectable, save for alternate waves from some fish and roses up front, was a faint

ABOVE — The Friday market in the plaza of San Francisco el Alto is famous for livestock and textiles.

BELOW — This is the passageway that leads to the market, where Miss Crane hoped to find the old designs.

whiff of woodsmokey Indian, nostalgically familiar to all of us who enjoy prowling around south of the border.

Suddenly the mother whisked her yellow-ribboned braids up over her neck and pinned them high. It was then I saw she had a pair of birds embroidered among some flowers around her collar. My hope died quickly; she said they were just doves, and only giggled and shook her head when I asked for monkeys and tapirs.

That afternoon it was the same story everywhere. Totonicapán was, zoologically speaking, a failure, though otherwise a delightful town. But, *huipiles* with *animales* from the *tierra caliente*? Oh, no! And giggles always followed after.

The next morning I left at dawn for San Francisco el Alto, almost 9,000 feet up in the mountains above. Every Friday they hold their market, famous the country over for livestock and textiles. It was Friday now, and perhaps, in all that crowd, there would be some blouses with jungle beasts.

Nine of us, including eight full-grown Indians, squeezed into an old five-passenger Dodge. Our breaths showed clearly, this fourth of July, and

his market vendor had plenty of olorful fabrics, but none with nimals. She was too shy and too fraid of the "evil eye" to look irectly at Miss Crane's camera.

we were glad of our crowded company for warmth. Since all the women afoot along the way were warmly wrapped, it was quite impossible to catch even a glimpse of their huipiles.

In San Francisco the market was all in the open air, cramming the plaza and pouring out on the adjacent streets. Although quiet, it seethed with life. Its color made the drabness of my recent mudflats as unimaginable as, when you are dining on curry, is the taste of a Mulligan stew. Overhead hung genuine stratosphere blue; all around the tile roofs and adobe walls were mellow with sun. And everywhere close by sang the colors of the Quiché heritage – greens and blues and purples in the wrapped skirts; blouses, woven or embroidered, in all the colors there are, juxtaposed in a fine and smashing carelessness. Scarlet marched next to orange; harsh red with green and white; bright pinks; magenta next to chrome. Out of context they would have been deplorable; here they were a glory.

Thanks to rumors of political unrest, tourists had been needlessly rare all week. In this crowd there weren't any at all, so there were no false notes. For hours I wandered about, watching the well-fed, tidy livestock changing hands, bargaining unskilfully for a skirt, taking pictures. The women always turned away from the camera, or covered their faces against the evil eye. Everywhere I asked for white huipiles with animals, with the usual result. Often the vendors spoke no Spanish, but only Indian tongues. But always there was a helpful neighbor to translate the inevitable answer: No monkeys. No tapirs. *No hay.*

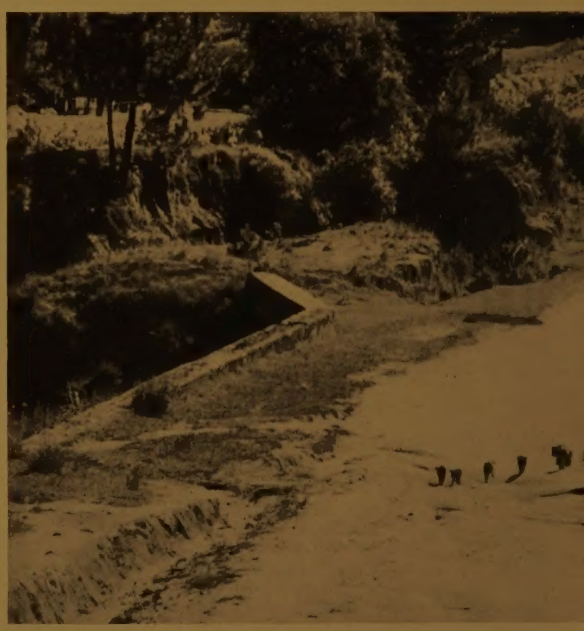
Finally, toward noon, tired, hungry, thirsty and discouraged, I gave it up and started down through the packed streets to find a lift back to Quezaltenango. It was all I could do to push through. The only difference between San Francisco el Alto on a Friday noon and Times Square on New Year's Eve is that in Times Square the women don't carry very much on their heads. Almost unconsciously I followed one of the basic rules of a tired naturalist: When you are too fagged to do anything else, make yourself dig just 50 more crabs, or look under exactly 25 more rocks – little ones! – or shake spiders from only 20 more bushes into your collecting umbrella. Or even, if you are beyond digging or lifting or shaking, inspect exactly 15 more trees for cocoons or snakes or nests. So, grimly, I started to peer

at 50 more huipiles. Everything was a blur except the collar region, feminine gender. I had just noticed grayly that No. 45 was nothing but San Cristóbal's flower pattern, and 46 was a nondescript number in blue when – 47 – whoops – there, unbelievably, it was.

For an electric instant nothing showed but a monkey, a lovely green monkey, unmistakably a monkey, with his tail curling properly underneath. Then I saw he was accompanied by a deer, several rabbits, a snake and two lions, purple and rampant on a field of pink. Finally, there came into focus above them the quizzical coppery face of a little, middle-aged woman, squatting behind a basket of corn. Feeling swiftly and miraculously on top of the world again, I asked her where she came from. She looked at me blankly. So did all her neighbors. Not one spoke Spanish.

Finally, nervous under all the attention, she simply got up, placed her basket firmly on her head and, to my despair, slipped into the crowd. But at that instant a passing man came to the rescue. "Who? That one? Oh – *She's* from San Andrés! No, not far . . . Just over those mountains!"

And so it happened, late that afternoon, that I found San Andrés Xecul. The last five kilometers were a climb on foot through tall cedars and thriving corn. The track was full of villagers returning home from San Francisco, keeping me cheerful company. It was fun to think that these people were perhaps actually related to the unknown woman who made the jungle zoo on the museum blouse. Obviously, they too appreciated their animals. A man flicked occasional flies from his lightly-laden donkey. Some women gently herded young pigs before them, carrying the smaller piglets in their arms. As we came into town, dogs came out, well-fed and friendly, wagging their tails even at the foreign stranger in funny clothes. The only trouble was that few people knew Spanish and not a single woman wore a zoo around her neck. Finally, however, a young girl understood and promised to guide me to the right place.



So Miss Crane set out on th road from the market town San Andrés Xecul, were th old embroidery was still mad

This was the first real clue – a woman from San Andrés Xecul with an animal-embroidered blouse. She spoke no Spanish.

d she found it—a woman ually at work on one of the l designs—although to her, tapir represented a horse.

She darted away and I followed, pantingly conscious of thin air, steep streets and sharp cobbles. At last we stopped at an open wooden door in an ordinary adobe house.

Inside a bar of sun was bright on a woman seated at a low table. She was stooped over a white cloth stretched on a square frame, working with her needle on a round design in many colors. She looked up and cordially asked us in—in Spanish. I looked beneath her needle. She was just putting the finishing touches on a tapir of Kelly green.

Feeling a triumph comparable to the best moments of Alexander, Columbus and Sir Isaac Newton combined, I put my first question to this undoubted lover of all the jungle beasts.

"Señora, where do you get the patterns for your animals?"

"Well, some we have from long ago. A friend of mine makes others. And some I make from my own head."

"Then do you often go down to the *tierra caliente*?"

"Oh, no. I've never been down there in my life!" Too bad that! Oh, well, now for the animals . . .

I pointed to a row of well-drawn yellow foxes. "What kind of animals are these?"

"Dogs, señorita."

"And the pink ones?"

"Pigs, señorita."

"These purple birds?"

"Chickens, señorita."

Out came my last and best hope. "And this green one with the curved nose?"

She was puzzled a moment. Then, "But that, I think, must be a horse!"

Alexander, Columbus, Sir Isaac and the tapir all faded quietly away. But after all, I reasoned firmly, there were compensations. The blouse in the market this morning had actually boasted a monkey. And later I learned that even the fine piece in the museum also came from this very village. So my links were complete.

We had said our good-byes and I was already in the street when the señora called me back. "Look," she said, "I forgot to show you this." And she proudly pointed out among the pink pigs and purple chickens a single blazing bird in green and gold. "*That* is our national bird. The quetzal. The bird of freedom. He lives only in the far-away forests." She beamed. "We *love* him!"

LITTLE FISH WITH A BIG FUTURE

By

MYRON GORDON

ALL THROUGH THE NIGHT the banana trains were noisily shunting box-cars around the docks that jutted into the Gulf of Honduras at Puerto Cortez. Four giant machines that resembled matched pairs of praying mantises conveyed the bunched fruit into the belly of the *Musa,* one of the many ships of the United Fruit Company's White Fleet. Seventy thousand branches of green bananas, cut that morning by natives with machetes in inland plantations, would be on the high Atlantic seas within the next twenty-four hours, and the golden, ripened fruit would be on your grocer's stand a few days later.

It was an efficient piece of farm-engineering, perhaps, but I wasn't in an appreciative frame of mind as I lay half asleep, half awake, in a hot and humid room in the Hotel Cortez. The hotel, built alongside the Tela Railroad yards, was more suited for a railroad station than a place of rest and repose. Between sleep and wakefulness, as the locomotive and its freight trains passed back and forth tooting shrill warnings, snorting blasts of live steam, and clanging box-car couplings open and shut, I kept worrying about oversleeping and missing my early fishing date at dawn. Every time the train tooted, snorted or clanged I awakened and gazed in semi-consciousness at the luminescent face of my watch. Finally I noticed with relief that its hands stood at 5. Al Campbell, my room-mate, saw me stirring and he got up, too.

In the soft tropical haze of dawn we walked along the palm-fringed beach and beating surf towards the docks to meet the fishing boat as the red sun rose from behind the silhouetted, steaming foothills of the Omoa Mountains. A pair of pelicans rode the gentle swells within the harbor waters. Gaudy but daft macaws screeched rau-

cously, their penetrating cries joining the muffled noises of the banana-loading machines. The chicken-like chachalacas hidden in the heavy jungle brush were in full voice, idiotically out of rhythm and violently dissonant. Ahead of me along the beach a lone sandpiper was beachcombing the furrow of ocean wrack for shrimps, worms and other marine delicacies. When I got close, it stopped its search, teetered its spindle-shaped body up and down on the fulcrum of its legs, piped plaintively, and flew away. High in the branches of a mango tree the oropendulas danced and sang, their song sounding like water gushing and bubbling out of an inverted jug.

The *Bobby Ann* was anchored at the far end of the dock and we made our way to her, step by step, over row-boats, native cedar dug-outs and sleek, neatly painted motor-boats that lay indiscriminately at the wharf. Captain Arzu looked with questioning eyes at my unusual fishing equipment. He must have been briefed to expect a conventional fishing enthusiast whom the Tela Railroad Company had invited for a pleasant day's sport on the Bay of Honduras. The boat was well equipped with heavy trolling rods and reels, stout lines and tackle in the form of large silver spinners. The Captain asked me to choose the gear I preferred.

Somewhat embarrassed, I explained that it was not my intent to go game fishing this time. I told him that what I wanted the fishing boat for was to take me to the mouths of every approachable river and brook that flowed from the Omoa Mountains and emptied into the sea between Puerto Cortez and the Honduras-Guatemala border. I would do my fishing there.

I held up my dainty 4-foot-square seine. I showed the captain the fine one-quarter inch mesh of my minnow seine, the cylindrical wooden floats attached to the upper margin and the five tubes of lead on the lower edge. From his expression I gathered he thought it ridiculously ineffectual. I asked Al Campbell to demonstrate its operation. We each took hold of a stout stick, attached vertically to either end of the seine, and marched along the deck of the boat as if we were wading waist deep through a body of water and combing out its hidden fishes.

The captain was both skeptical and perplexed. It was apparent that never before had he met such fishermen. He excused himself politely, saying he had to telephone the superintendent of the company for additional instructions.

It was fortunate that I had talked with Superintendent Joseph Acock of the Tela Railroad Company the night before. At that time I explained that I was doing research work and that I was a staff member of the New York Zoological Society, the organization that operates an Aquarium and Zoo in New York City. I told him that I was in search of two special kinds of small freshwater fishes that we needed as test animals in cancer research.

Like most people, Mr. Acock was surprised to learn that fishes were used in a cancer research project. I told him that fish had cancerous diseases, many of which are amazingly similar in microscopic details to those of man, and almost identical in the course they run. Anything that we could learn of cancer by working with fishes, I stressed, would be of potential value for man's understanding of this disease. I told Superintendent Acock that I was seeking an answer to this question: Are some types of cancer hereditary? Fishes were suited for the study of the inheritance of one particularly dangerous type of cancer known as melanoma, or black cancer. In man this disease is more likely to strike blond people, particularly those with translucent skins, who do not tan when exposed to the sun, rather than dark skinned ones. Negroes rarely develop melanoma. What part do hereditary differences play in making negroes practically immune and blonds particularly susceptible to melanoma? We

Little streams flowing from the foothills of the Omoa Mountains into the Bay of Cortez were the hunting grounds for the black-spotted fish Dr. Gordon wanted

know that negroes have many more black pigment cells in their skins than do whites, but there is hardly a person alive who does not have some black pigment in his skin. Certain human birth marks may turn out to be the mark of death. Since melanomas are started by malignant black pigment cells growing without restraint, research workers hope to solve the nature of this kind of cancer by studying the causes that transform normal black pigment cells into abnormal ones.

The fishes I was looking for have a peculiar kind of black pigment cell so big that one may spot them quickly with the unaided eye. The fact that these cells are large is not as important as the fact that they are capable of producing black cancers in fishes with a particular kind of heredity. I had already discovered in the laboratory that spotted fishes with large black pigment cells differed from their unspotted brothers and sisters by a dominant hereditary unit or gene. In the melanomas of a fish the disease-producing black cells are almost identical in appearance and action to the malignant black cells in the melanomas of man. That is why investigation of the nature of black pigment cells in fishes is encouraged. It is a good bet that any vital discovery made in the study of the causes of this black disease in fishes will also be of significance in understanding its origin in man.

Two groups of small, live-bearing, Central American freshwater fishes, the platyfishes and swordtails, have among their numerous members some that are spotted with the vitally important black pigment cells. From my previous field explorations in the rivers of Mexico and British Honduras, I knew that the spotted fishes, when found, are rare. We are constantly in need of new stocks of these fishes from many different regions for additional breeding tests. I had every reason to believe that, although practically nothing was known about the freshwater fishes of northern Honduras, we would probably find swordtails and perhaps some platyfish in this area. We hoped that among those we found, some would be spotted with large black pigment cells.

Captain Arzu returned after making his telephone call to his chief. Without further words or delay he told his Carib boy assistant to loosen the line that held the *Bobby Ann* fast to the dock. He stepped below to start the engine and within a minute we were on our way across the Bay of Honduras.

About a quarter-mile out to sea, I looked back along the wake of our boat to the point of our departure. From this distance I saw that the village of Puerto Cortez is built on a narrow piece of land that juts from the mainland of Honduras like a slightly crooked index finger extending from a tightly clenched fist. On the mainland the country is a mass of low-peaked mountains. Within the bend of the crooked finger of land the clear blue sea forms the Bay of

Cortez. The cord that binds this village together and ties it to the mainland is the railroad, for the ramshackle town is strung along on either side of the tracks. On its furthest point out to sea where the peninsula widens a bit, the homes of the workers of the Fruit Company are grouped. Outside of the orderly arrangement of the company's buildings on well-kept grounds that have the atmosphere of a country club, the rest of the town is a tumble-down array of makeshift, unpainted shacks that seem to be characteristic of the unskilled peasantry.

Looking ahead of the bow of the *Bobby Ann* and comparing the contour of the coast line west of Puerto Cortez with my map, I made out another projection of land along the hazy, distant landscape. This was Point Omoa. Just beyond the point lies Campo Verde, an abandoned banana plantation now cultivated privately by some of the more enterprising free-lance Caribs. What interested me at the moment was the information that a freshwater stream, the Río Omoa, ran through the plantation and emptied into the sea just beyond the Point. I asked if it would be possible to stop there and look around. Captain Arzu said yes, and so our goal for the day was set.

When we were well within the cove on the western part of Point Omoa, the captain cut the motor and threw the anchor overboard. We were still about a quarter mile from shore, but the extremely shallow waters prevented the *Bobby Ann* from approaching closer. Our trailing canoe was brought alongside, and the Carib boy paddled us to shore.

The waters that feed the Río Omoa arise from a series of springs that trickle out of the sand and stony areas of the foothills of the nearby Omoa Mountains, and as the river crosses the narrow strip of fairly level coastal plain its meandering waters run deep and are surrounded by an entangling mass of vegetation. The brooks are rarely very long — perhaps a mile or two — and the vegetation closes in so quickly that we had not gone an eighth of a mile before we were completely hemmed in right, left, and from the top by the jungle.

The prizes of the fishing trip — a pair of swordtails. The black-spotted male at the top is rare in nature. The female is below.

It was impossible to use the minnow seine along the deep and heavily overgrown banks of the river, so we went back to the shallow areas at the mouth of the stream. There within sight of the sea we caught several species of fishes that are at home where fresh water mixes with that of the sea: some mullets, cichlids, gobies and eels.

In a spring nearby we caught our only live-bearing fish, a "false-swordtail," *Pseudoxiphophorus*. A wiry, gray-haired negro clad in a tattered blue shirt, bramble-torn dungarees and sock-less, lace-less shoes, located the spring for us, for it was on the land which he was farming. As we stepped over the stubble and furrows hardened by the prolonged drought, he kept

swinging his machete, hacking away at the ever-encroaching saw-toothed cane brake that threatened to overrun his small stand of corn. David Johnstone was a fine, soft-spoken cheroot-smoking gentleman. He had dignity. It was a distinct pleasure to see him managing his life in his own manner – away from the mixed up way of life in the villages. When we had finished our work in his territory he invited us to his hut, built alongside a lagoon. He bade a boy climb one of the tall palm trees and cut down several coconuts with a machete. Back on the ground, the boy skilfully hacked away the outer fibrous covering of the coconut and exposed the soft white meat. Then with a twist of the point of the machete he made a neat inch-long hole at the cut end. After our work in the hot sun the cool, sweet water of the unripe coconut was welcome and delicious.

We had caught neither swordtails nor platyfish that day but we were pleased with our experiences. In Honduras, as elsewhere in Central America, I learned that there's always mañana.

The next day at daybreak we boarded the *Sula* in charge of Captain Marcus Lambert, assisted by our friendly, lanky Carib boy. Mr. Lambert was briefed on our plans in advance and he told us that we ought to go to the most westerly stream in northern Honduras, almost at the Guatemalan border. In our leisurely way westward across the Bay of Honduras we eventually came within sight of the long, palm-fringed sand bar that is formed by the Río Motagua just within Guatemala.

As the *Sula* approached the cove of the village of Masca, I saw a native in a dugout canoe, paddling furiously, round and round, apparently at random. He paddled standing up, steering skilfully and sometimes cutting the water sharply in huge figure eights. Suddenly, he paddled close to shore and then quickly back-tracked out to sea again. Just about the time we landed by a canoe of our own, the erratic canoeist shouted some signal. Immediately another canoe, manned by two natives, shot out from shore and dashed to the side of the first. One of the men stopped paddling and threw an activated bomb into the water; it exploded almost instantly with dull, muffled roar, and a moment later the surface of the sea was broken as stunned fish bobbed up all around. The men reached over the sides of the canoe, grasped the floundering fish and threw them into their boats.

I had mistaken the antics of the first canoeist, for he had not been paddling aimlessly. His job was to discover, follow, and herd a school of tunas into a compact group for mass execution. In a matter of minutes the three men picked up 29 large tunas, some of them two feet long.

In the Rio Mapache we caught our first swordtail, but in small numbers – and no spotted ones.

It was not until the third day's work of exploration through the tiny village of Veracruz, that we found swordtails in fairly large numbers in an unnamed brook. The surf and wind had built up a slight ridge of sand against which the stream backed up, forming a shallow, brackish water pool before debouching into the bay. Near the sea we caught a near relative of the sea horse, a reddish-brown striped pipe-fish, sardine-like silversides with lemon-yellow fins and small silvery mullets.

Around the village the heavy jungle growth had been cleared for farm and pasture and this permitted us to approach the brook at many suitable points for seining. Upstream a few hundred feet in two-to-three-foot-deep pools, we caught seventy red-striped swordtails. One of them had a few large black pigment cells.

We were accustomed to place all the fishes we caught in fruit jars containing a solution of formaldehyde. This preserves them for later study in the laboratory. I emptied one jar of its formalin, rinsed it out thoroughly, filled it with brook water, and placed one spotted and one unspotted live swordtail inside. I made it a point to show them to Mr. Acock when we returned to Puerto Cortez. Neither he nor the natives were aware that these beautiful fish lived in the vicinity. Nor were they aware that some of the smaller fishes give birth to living young.

I took the fish back to La Lima, the headquarters of the United Fruit Company. In La Lima the Fruit Company kindly put me up in one of their clean and commodious guest houses. For a week the swordtails lived in the narrow confinement of a quart fruit jar. My problem was to keep them cool. When we caught them

(*Continued on Page* 166)

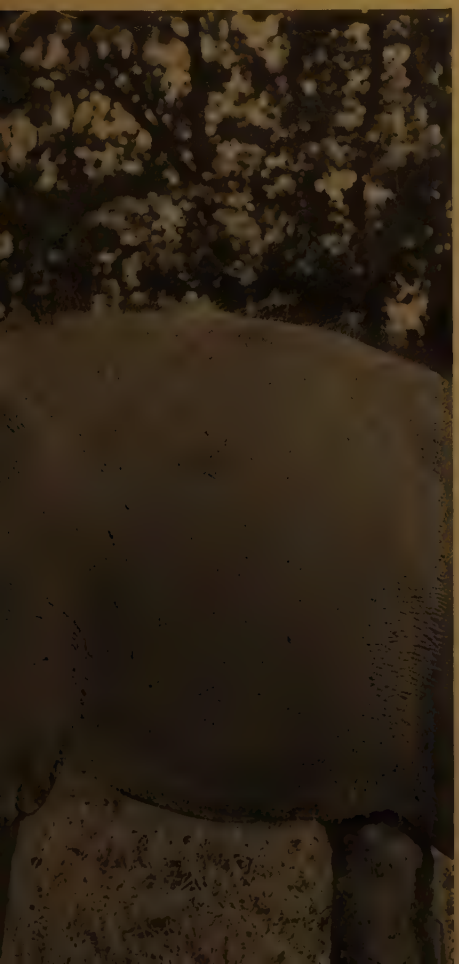
THAT SWEET CANDY!

Photographs by SAM DUNTON

The moment she walked out of the horse van that brought her to the Zoological Park, we knew that Candy was going to be our favorite Elephant. A less self-possessed baby might have boggled at walking down the steep and springy planks, but Candy didn't. And she made friends instantly with Keeper Neil Dapolite who has the duty — and the pleasure — of being her mentor.

The first thought of a baby Elephant—or any Elephant—is food. Candy learned in one easy lesson that Keeper Dapolite was a goldmine of apples, to be quarried out of his pocket and eaten.

Eyes tight shut, exactly like a child, Candy awaits her morning showerbath. But, as the picture on the right shows, she knows very well how to shower herself.



The White-backed Dipper from Ecuador is accustomed to walk under water, so we had to provide a cage with a bathing pool.

Two More Rare Birds

By LEE S. CRANDALL

ONE OF THE MOST INTRIGUING FEATURES of the maintenance of a large collection of birds is the infinite variety of specializations for innumerable life niches developed in the group. A new specimen is always a challenge, for unless its general requirements are approximated its successful introduction cannot be accomplished.

Among the most curious modifications found among passerine birds are the habits of the Dippers, for these small dwellers among mountains seek their insect and crustacean food beneath the water of highland streams, walking as calmly among the mossy under-surface rocks as a Wood Thrush in his dry land hunting grounds.

Dippers are small birds, no larger than Wood Thrushes, but with long, sturdy legs, strong feet and short, perky tails. They are well distributed, in many forms, throughout mountainous areas of northern Europe and Asia and in western North America. Following the great mountain

ranges, Dippers have found their way through Mexico and Central America as far south as northwestern Argentina.

The Dippers are notoriously difficult in captivity and up to this year no member of the family (Cinclidae) had ever been included in our collections. It was really thrilling, therefore, to find in Charles Cordier's Ecuadorian shipment of last June 19, a White-backed Dipper (*Cinclus leucocephalus leuconotus*), as briefly noted in ANIMAL KINGDOM for July-August. Most of the Dippers are dull gray or brown in color, sometimes with a touch of white at the throat. But in our bird, the dark gray is relieved by white cap, back and breast, all more or less freckled with gray. Found only at the higher elevations, it occurs in western Venezuela, Colombia and Ecuador.

In spite of its aquatic feeding habits, our Dipper has presented no special difficulties, readily taking bits of hard-boiled egg, cottage cheese and scalded meat from a food dish and mealworms from its keeper's fingers. But its re-introduction to bathing water was a different matter. We knew that if ducks are kept dry for long periods, the plumage loses its power to resist water, quickly becoming saturated and subjecting the bird to risk of pneumonia. We also knew that alternating wet and dry periods, repeated for a few days, will restore the normal resistance of the plumage.

Dippers have a very heavy under-coat of down, with strong, tight contour feathers. Our bird had lived in a dry cage, with no chance for immersion, for some weeks, and his plumage appeared to be in perfect condition. But what would happen when he took his first dip?

There was only one way to find out. We liberated him in a cage containing a pool three inches deep and two feet across. Immediately the Dipper plunged in, splashed a bit and climbed out. A sponge could have held no more, the proverbial drowned rat could have looked no worse. The dry duck system was obviously indicated and for the next week our Dipper was allowed to dip until he was thoroughly saturated and was then returned to his dry cage. At the end of it, his sleek, hard plumage was fit for any mountain torrent and he was liberated in a

A very great rarity is the Ocellated Tapaculo, also from Ecuador—so rare that almost nothing has been reported on its habits.

planted cage in the Jewel Room. This contains not only rock-work and growing plants but a pool complete with miniature water-fall. And here our Dipper disports daily, splashing in the water and running beneath the fall, as he must have done in the cold streams of the far-off Andes. And as the droplets strike his reconditioned plumage, they roll off as briskly as they would from any duck!

WITH THE SECOND GREAT PASSERINE RARITY in Charles Cordier's Ecuadorian collection of 1952, the difficulty did not lie in habits but rather in names. For the designation Ocellated Tapaculo (*Acropternis orthonyx infuscata*) there is no properly explanatory equivalent. Adaptations of local names for members of this obscure group – "Huet-Huet," "Turco," "Chucao," "Tococo," – convey little of relationships, and the use of the English name "Babbler" is equally confusing, since it has long been preëmpted by an Old World family. So, when we are asked "What *is* a Tapaculo?" we can only reply "A Tapaculo!"

The situation, of course, is not quite so desperate as all that – the trouble is only that in order to be at all understandable, a lengthy explanation is required.

The Tapaculos are an American family (*Rhinocryptidae*) of some forty forms, inhabiting mountainous areas from Costa Rica to northern Patagonia. In the Andes, they may range from sub-tropical foothills to elevations of 12,000 feet. They are ground-haunters, with the short wings and powerful feet best adapted to a terrestrial life.

Only one species, the Galleto or "Little Cock," (*Rhinocrypta lanceolata*), of Argentina and Patagonia, is really well known, even locally. Of this bird W. H. Hudson, in "Birds of La Plata," gives an interesting and amusing account:

"The vernacular name *Gallito*, or 'Little Cock,' by which this species is familiarly known in Patagonia, cannot fail to strike every one who sees the bird as appropriate, for it struts and runs on the ground with tail erect, looking wonderfully like a minute domestic fowl," Hudson says. "In the neighbourhood of Carmen, on the Rio Negro, it is very abundant, and when I went there its loud deep chirrup, heard from every side in the thicket, quickly arrested my attention, just as the perpetual chirping of the Sparrows did when I first landed in England. In the interior of the country it is not nearly so abundant, so that man's presence has probably in some way affected it favourably. Its habits amuse and baffle a person anxious to make its acquaintance; for it scarcely possesses the faculty of flight, and cannot be driven up, but it is so easily alarmed, so swift of foot, and so fond of concealment, that it is most difficult to catch a sight of it. At the same time it is extremely inquisitive, and no sooner does it spy an intruder in the bush than the warning note is sounded, whereupon every bird within hearing hops up into a thick thorn-bush, where it utters every three or four seconds a loud hollow chirp, and at intervals a violent scolding cry, several times repeated. When approached they all scuttle away, masked by the bushes, with amazing swiftness, to take refuge at a distance, where the loud protest is again resumed; but when the pursuer gives up the pursuit in disgust and turns away, they immediately follow him, so that he is perpetually encircled with the same ring of angry sound, moving with him, coming no nearer and never allowing its cause to be seen."

No such record exists of the ways of the Ocellated Tapaculo of the Ecuadorian Andes and our own observations are definitely skimpy. Cordier reports that our specimen was taken at Lloa, a village on the western slope of towering Pichincha, at an elevation of 11,000 feet. About the size of a female Bobwhite, it has the body plumage black, with small white ocelli, while the head, neck and lower back are a bright rust color. The hind claw is straight and elongated, like that of a lark and the base of the bill expands into a broadened plate.

Liberation in a planted cage confirmed the general characteristics of its family. Our Tapaculo instantly sought shelter beneath the foliage, emerging only for food. Later, as its confidence increased, it occasionally climbed clumsily among the lower branches, where it obviously was not fully at home. Insectivorous in feeding habits, it rejected all offers of fruits. In spite of its size and the unusual power of beak and claws, it was entirely inoffensive toward smaller cage-mates.

In these brief notes, our present meagre knowledge of the Ocellated Tapaculo in captivity is summarized. Undoubtedly, much remains for future aviculturists to learn.

This Australian Python Eats Other Snakes

By DAVID FLEAY

THE NAME "python" has a fairly definite meaning for most persons. It conjures up a vision of a large, heavy-bodied snake that throws its coils about a small antelope, a bush pig, a rat, a bird or some other warm-blooded kind of prey, and simply squeezes it to death.

Apart from the fact that most pythons are not particularly large or heavy-bodied, this mental picture is all right. Even so it doesn't tell the full story about the Australian Black-headed Python (*Aspidites melanocephalus*). For the Black-headed Python is a snake-killer, and by preference a killer of some of Australia's most venomous snakes.

It was in 1940 that we first obtained evidence of this snake-killing propensity, and like so many curious discoveries, it was made by accident. A number of Black Snakes (*Pseudechis porphyriacus*), big and venomous fellows, had been established in winter quarters among plentiful grass hay in a heated house. In the same "dormitory" we were keeping several Carpet Pythons, an Amethyst Python and a 5½-foot Black-headed Python that had arrived from Queensland earlier in the year.

Over a period of several weeks three of the Black Snakes disappeared. An immediate and thorough search was made after each disappearance, for one does not like to have a Black Snake wandering at large, but the events were a com-

The Black-headed Python has a shovel-nosed appearance. The head and part of the neck are a glistening black that contrasts with the brown-barred body and yellow ventral area.
David Fleay Photo

plete mystery. Floor, walls and roof were all solid and snake-proof, and if any of us noticed the plumpness of the sleepy Black-headed Python we made no comment on it, for there was a plentiful supply of rats and we supposed the python was getting perhaps a little more than its share.

But one morning the mystery solved itself quite spectacularly. The Black-headed Python had sloughed its skin the day before, for the third time in six months, and after several weeks of dull coat and milky eyes it was bright and shining again. And active, too — for there was a terrific threshing and twisting in the pile of grass hay where it usually hid. We pulled the grass away and found that the python had encountered one of the remaining Black Snakes and had closed its jaws in a tight grip just behind the Black's head. The victim was writhing and twisting without being able to pull loose, and moment by moment the python caught the struggling body in a new grip of its own coils and immobilized another section of the Black. The struggling snakes were so intent — one on pulling loose, the other in tightening its hold — that they paid no attention when we lifted them up in a bag and carried them out of doors to be photographed.

After the picture-making, when the two snakes were lying on the ground, the Black-headed Python finished the job. Inch by inch it worked its shovel-nosed head around to face the weak but still wriggling Black's head, engulfed the head in one motion, and began to swallow. In less than half an hour from the beginning of the battle, the tip of the Black Snake's tail disappeared and there was nothing to show for it except a series of rippling corrugations in the python's skin.

The swallowing feat was all the more remarkable because the two snakes were of almost the same length.

Five days later digestion was complete, but by that time we had removed all venomous snakes of value from the winter storage room so that when the Black-headed Python became hungry again it could not devour our prizes. Black Snakes had cost far too much effort in plodding over the Murray River swamps to be sacrificed to a python's appetite. Thereafter we offered only "second rate" venomous specimens and Copperheads that had been killed on the road, and these only as special delicacies to supplement the staple diet of rats. It was noticeable, however, that the python definitely preferred snakes to warm-blooded prey, and poisonous snakes to small pythons; if both venomous snakes and rats and mice were offered

re the Black-headed Python has a angle-hold on a large and venom- s Black Snake, and has begun the w process of swallowing it down.
David Fleay Photo

Little by little, the Black Snake is disappearing—even though it is almost as long as the Python. Half an hour completed the swallowing.
David Fleay Photo

at the same time, the python turned immediately to the snakes and disregarded the rats and mice.

Bites from such formidable fellows as Tiger Snakes, Copperheads and even Brown Snakes (*Demansia textilis*) bothered it not at all. To my own knowledge, up to 1947 this particular specimen had accounted for more than a hundred venomous snakes—a considerable factor, no doubt, in its attainment of approximate full size of eight feet and in its sleek and healthy condition.

Despite its pugnaciousness where venomous snakes are concerned, the Black-headed Python is temperamentally easy-going in regard to human beings, even exceptionally so. I have never known one to bite or otherwise resent gentle handling when once it was brought into captivity. Our big fellow was a splendid reptile for demonstration purposes and would permit anyone to handle it. Oddly enough, spectators who were not herpetologically inclined seemed to regard the Black-headed Python with more than the aversion they reserved for other snakes, possibly because its tight, glistening scales and its olive brown to dark brown body color, crossed with darker bands, gave it a sinister, tigerish appearance. The head, too, is rather unusual, being quite small for a python, with a projecting, almost shovel-nosed upper jaw.

The home of the Black-headed Python is far northern Australia and I first made contact with the species in its home country near Townsville, Queensland, in 1939, bringing back from the rocky, knoll-like outcroppings of that area the specimen whose feeding habits were revealed to us as described above. Even before then, the snake had a reputation for possessing a voracious appetite. Heber Longman, the former director of the Queensland Museum, once found a specimen only an inch in diameter that had died because the head of a bustard, or plains turkey, was stuck in its mouth. I hasten to add, however, that the bustard had been shot and the severed head left on the ground, where the little snake found it. Not even a Black-headed Python — an inch-thick juvenile — would (I think) attempt to swallow an entire bustard!

There Are Lessons for Us in

Similarity and Sociability Among Animals

By EDWARD A. ARMSTRONG

WE HAVE NOTED how readily many sociable animals copy each other's behavior.* They have an inborn propensity to do so. This, on the whole, makes for orderliness in the groups and an efficient organization of the individual's life. If, for example, birds are to fly as a flock, it is essential that there should be a measure of unanimity and organization for otherwise chaos would ensue. To a superficial observer a reindeer herd might appear just a moving mass of animals but investigation shows that in such a herd there is a high degree of organization. Even the fowls in our hen-runs have their social order. There is a dominant bird which bullies all the others; and so down the scale to the underling who is pecked by all. The poultry-keeper knows how liable this bird is to become ill and succumb but there is reason to believe that, on the whole, the "peck-order" is advantageous.

Suggestibility, or "mimetic susceptibility" if we prefer a term without human implications, is both an outcome of sociability and a foundation for it. It involves and fosters "fellow-feeling". Among higher animals there are various competitive impulses connected with the securing of adequate food and obtaining a mate which might readily give rise to fighting if they were not modified. This underlying "fellow-feeling" enables such modifications in behavior to arise. For example, there are various birds, such as some ducks, which conduct their courtship in parties, several drakes accompanying one duck. Here is an explosive mixture — sexual desire and male rivalry. We might expect fierce fighting to break out among the birds, on the principle that "none but the brave deserve the fair." In spite of their frenzied excitement, fighting does not occur and no corpses of defeated lovers sully our lakes and rivers. Fighting has become refined into vigorous but harmless jousting. Watch a paddling of red-breasted mergansers in some bay and you will notice several gorgeously adorned drakes swimming around and close to the duck, but instead of striking one another they display as they swim, opening wide their mandibles to reveal bright red mouths and pumping their necks up and down. Eventually one will be accepted by the duck, but no fighting occurs. The birds stimulate each other and courtship has become a kind of gaping competition. It is all much less crude and much more effective than beak-to-beak conflicts would be because runners-up in these marriage stakes live to woo and win another day. Human beings, too, in all stages of society, have found better ways of securing mates than fighting duels, though competition goes on; in the eyes of the beloved, status, wealth and other such factors play an important part. So the competition for jobs by men may be regarded as, in some respects, the equivalent of the refinement of rivalry among birds into display.

The essential point is that competition in dis-

* See "Behavior Is Contagious, Too", by E. A. Armstrong, in ANIMAL KINGDOM, May-June, 1952.

play takes the place of fighting among many animals. In their excitement birds posturing in a party inspire their companions to display as they do and so the whole group's fellow-feeling is involved. Instead of a mêlée of squabbling individuals the group becomes an orderly unit. Moreover, it seems that we cannot make a clear distinction between such emotions as "anger" and sexual desire so far as birds are concerned, for the attentive observer of such displaying parties of mergansers as I have described, or of oystercatchers and other birds which display in groups, has the impression that the birds are involved in a kind of generalized excitement rather than possessed by an emotion similar to that a human being might feel in comparable circumstances.

It seems certain that acting together increases the vitality and efficiency of individuals as well as contributing to the harmony of the group. Thus the individual coordinates his behavior with that of others in ways which are advantageous to all. The philosopher Hobbes spoke of the solitary life for man as being "nasty, brutish and short," for man is essentially a social animal. Those who have ever camped for some time away from all human society will endorse this, for the craving for companionship can become an ache. Apart from society a chimpanzee is not a real chimpanzee at all, as the psychologist Kohler has said. So great is the craving for company that animals separated from their own kind may form most incongruous associations. A goose may even "make friends" with a packing case and act as if it were another goose.

It is highly probable that the activity of the group may stimulate the individuals to be more active, not only by the direct and "psychological" force of example, but sometimes by bringing about bodily changes which in turn result in alterations in behavior. A few years ago J. T. Emlen and F. W. Lorenz performed an interesting experiment on valley quail, implanting a hormone preparation beneath the skin of some members of the covey. As was expected the effect was to bring the treated birds into breeding condition earlier than usual, but the most significant aspect of the experiment was that the untreated quail, influenced by the pairing-up of their companions, also formed pairs abnormally early. Here we have an example of a change in the behavior of some members of a group being effective in altering the behavior of their companions in such a way as to accelerate breeding. Physiological development was altered through psychological channels.

As long ago as 1890 a naturalist in India noticed that there was a tendency for birds in a colony to be at approximately the same stage in their breeding cycle but at a different stage from the birds of another colony not far away. This observation has now been verified by observers of many other species. To some extent this synchronization within a nesting colony appears to be due to a tendency for the older birds to nest together. The younger birds sometimes have to seek nesting quarters either on the fringes of the main colony or elsewhere. Making allowance for this it still seems that in a big colony birds stimulate each other by their constant activities and that this corporate stimulation may tend to synchronize the breeding of the birds through mutual suggestibility. Synchronized nesting confers various advantages. For instance, such birds as terns which feed on shoaling fish unwittingly indicate to one another as they dive where food is to be found. Thus as long as localized supplies of food are exploitable by a number of birds it is advantageous for many to be able to go to the place where one bird has discovered such supplies.

So important does mutual stimulation seem to be among birds, whether on set displaying grounds or in the nesting colony, that there is reason to believe that if numbers fall below a certain level excitement does not rise sufficiently high for the breeding cycle to take its course. This is difficult to prove but it may be significant that most of the well-known birds which have recently become extinct were highly social – such as passenger pigeons, the heath hen, the Carolina parrakeet and the great auk. The extent of man's depredations on some of these species is notorious;

everyone knows how trains were laden with the carcasses of passenger pigeons in the years of slaughter. Nonetheless, direct destruction by man does not seem adequate as an explanation of the disappearance of these birds. The passenger pigeon was among the most social of all birds. Reports state that in their close-packed roosts they even squatted on top of one another. It is possible that flocks, depleted after man's ravages, were insufficiently large for the birds to stimulate one another to achieve successful breeding.

At all events there is much to show that for many species the advantages of breeding in a large colony outweigh the disadvantages, which are often considerable, for great numbers of birds breeding together render the nesting grounds conspicuous to their enemies, the nesting birds sometimes interfere with each other and may even massacre each other's chicks if they wander from parental care. It appears odd to some of us that human beings who spend their days in crowded cities should choose for their holidays crowded seaside camps, but obviously for these people, too, the advantages outweigh the disadvantages and they enjoy the social stimulation provided. The words of the song express what a great many people feel — "The more we are together the merrier we'll be."

The parallels between animal and human behavior in this matter of community feeling and group stimulation go further. Travellers among primitive peoples have often commented on the corporate solidarity of such communities and, for example, the strange way in which common consent is quickly and tacitly reached after a matter concerning the clan has been discussed. Suggestion, corporate feeling and social stimulation play an important part in these folk's lives. This is true also of the less industrialized communities in Europe. Thus Tomas O'Crohan, in *The Islandman,* describing life on the Blaskets, a tiny isolated group of islands off the west coast of Ireland, says, "It's still the custom on the Blasket — as it always has been — that if any of them start on anything all the rest are eager to follow. Some years the whole island gets married and for seven years after that there won't be a single wedding." On the still more isolated island of St. Kilda, forty-five miles out in the Atlantic from the Outer Hebrides, Martin Martin, writing in 1698 when the population was 180, speaks of the marriage of "fifteen Pair of the Inhabitants on the seventeenth of June, who immediately after their Marriage joined in a Country Dance, with a Bagpipe for their Music, which pleased them exceedingly." Thus on this day one-sixth of the population was married.

These are pictures of the life of flourishing small communities, closely integrated with a vigorous social life in which religious observances, music and dancing all contributed to the general well-being. We have examples of the obverse of the medal also, where social life has fallen into decay and work and play, religion and amusement are not adequately integrated into the social structure. On some of the islands of the South Seas the advent of the white man with his innovations disrupted social life and the population dwindled because corporate life lacked vitality and society was without the "will to live." In 1950 I was on an island in Shetland where practically a whole generation had remained unmarried. The population was about two hundred yet there were only seven children of school age! With the decay of the old culture social life waned and in its decline almost brought society itself on the island to an end. Without the village dance, the harvest festival, community worship, the chaffering of the market, the amusements of the fair-ground, or their equivalents, society disintegrates.

If we observe birds closely we find that their way of life involves a number of forms of behavior which dove-tail with one another to form a pattern. The nature of the food-supply, the character of the pair-bond, the design of the nest, the rôles of the parents in tending the young, are all closely related to one another, and if one of these items in the general pattern is interfered with the whole system of activity may come to grief. With some social birds the company of

others seems to be so important that the behavior of isolated individuals is apt to be abnormal. Man's culture-patterns are also delicately poised systems. To interfere with them is to risk disaster. It has now become the rule among wise conservationists to study a system of animal and plant relationships before interfering with it; so, too, with social reform in human society. An ardor for reform is not enough. The first essential for any reformer is to achieve an understanding of that which he desires to reform. As I have endeavored to show, the sociologist may learn things of value from the ordering of society among ants, birds and beasts.

Our Duckbills Moult by "American Time"

By JOHN P. BLAIR

WHEN AN ANIMAL is brought to the Zoo from the other side of the world, its adaptability to our reversed seasons — winter here and summer there — is ordinarily of interest but of no great practical importance. It is otherwise with our Duck-billed Platypuses from Australia, for we have had some slight hope of creating conditions that will induce them to breed, and it is necessary to make every observation that will tell us whether they are sticking to their natural Australian breeding season of September-October (the Australian spring) or have switched to the actual American springtime. Moulting is one indication, we think, for in Australia they moult *after* the breeding season.

When David Fleay, the Australian naturalist, arrived with our three specimens in April, 1947, he reported that the moulting months in the animals' native habitat vary somewhat with location. In Queensland, Platypuses moult in December and January, while in Victoria they go through the shedding process in January and February. Our specimens came from Victoria.

According to Mr. Fleay, all three had done "some" moulting in January of 1947, yet in August of that year it was noted that Penelope was scratching and preening herself to an unusual degree, both during the exhibition hour and at night. Bits of fur would be seen floating in her swimming tank each morning for a period of almost a month. On the other hand, Betty, the other female, which shared Penelope's quarters, ate the same food and swam in the same tank, gave no indication of similar behavior.

About the time that Penelope completed her moult, bits of fur began to appear in the male's tank and he, too, began to scratch and preen more than usual. His activity continued to about the first of October, thus equalling Penelope in taking about a month to moult.

A record of the moulting periods has been kept, for whatever guidance it can furnish us. It can be summarized as follows:

	Moult Began	*Moult Ended*
	PENELOPE	
1947	August 8	September 5
1948	August 10	September 10
1949	August 9	September 5
1950	August 5	September 4
1951	August 6	September 15
1952	August 6	
	CECIL	
1947	September 5	October 1
1948	August 30	September 29
1949	August 14	September 18
1950	August 12	September 16
1951	August 10	September 16
1952	August 11	
	BETTY	
1947	Did not moult	
1948	Partial moult, mid-July	

Betty, it will be noted, failed to moult in the year of her arrival, and in 1948 passed through

a short period of scratching in mid-July, which was definitely off-season for either Australia or America. Following this "half-moult" she was off condition and fed lightly, steadily growing weaker until she died on September 6, 1948.

Whether or not the breeding season has changed, the moulting period definitely has. Penelope apparently made the switch completely the first season and has been starting her moult consistently during the first two weeks of August of each year.

Cecil, on the other hand, started a little late and has been moulting earlier and earlier until now he is practically in step with Penelope.

It is of interest to note, too, that practically no shed fur has ever been found inside the hay-filled wooden tunnels, or burrows, where the animals sleep, except on the "squeegees" that are placed across the tunnels to scrape the water from the Platypuses' fur. This indicates that normally — or at least here — the scratching and shedding take place entirely in the water.

News from the Conservation Foundation

Dr. Kingsley Davis Leaves For Africa

Having completed his summer assignment of work on the Population-Resources project, Dr. Kingsley Davis left on October 1 for a two and a half months' field trip in Africa under the auspices of the Carnegie Corporation. The purpose of Dr. Davis' expedition will be to study situations where there is low fertility among non-industrial societies.

Educational Conference at Purdue University

A joint conference of the National Committee on Policies in Conservation Education and the Conservation Foundation was held at Purdue University, Lafayette, Indiana, on September 15-19. The Foundation staff was responsible during the summer for rounding up descriptions of how conservation education can be integrated into various established educational systems, prepared by a wide range of experts in the field. As combined in a 135-page document, these expressions of opinion by conservation education leaders formed the basis of the discussions at the conference.

Ronald Press to Publish Report on Vegetation-Management for Water-Yield Control

Dr. E. A. Colman has finished his year's study of methods of vegetation management for water-yield control, and a contract has been entered into with the Ronald Press for commercial publication of a book by Dr. Colman on this subject. It will be published late in 1953. Dr. Colman will shortly return to the University of California at Berkeley to complete the manuscript.

Alaska Survey Nears Completion

Last May Drs. F. Fraser Darling and Starker Leopold went to Alaska in a joint project of the Conservation Foundation and the New York Zoological Society for the purpose of studying the long-range effects of environmental changes on the Caribou and Moose populations as well as making first-hand observations of other wildlife protection problems. The report of this research is expected to be completed by the end of the year. A number of interesting photographs of the field work have been received.

So far, one of the general conclusions reached is that in many areas Moose will increase, whereas

Caribou populations can do no more than hold their own with little or no chance of gain. The field work is covering most of Alaska, including three trips to Barrow. In one area of some 24,000 square miles, the investigators saw no ground elevation of more than three feet, and on these lilliputian "hills" they found substantial vegetational change between "base" and "apex."

A paper on the subject of certain aspects of the field work was delivered at the Alaska Science Congress at Mt. McKinley Park in mid-September.

Marine Resource Study

A substantial part of the Marine Resource report will be received by the first week in October, and Dr. L. A. Walford, who is directing the work, expects to complete the study early in 1953.

"Salt-to-Fresh Water" Report Soon Ready for Release

The study of techniques of converting salt water to fresh water being conducted by the Nuclear Development Associates under the Foundation's direction is reaching final form and the report of this work is due this autumn. Present indications are that, despite newspaper reports to the contrary, there is no immediate prospect of obtaining large amounts of fresh water from salt water at prices that would be economically practicable.

BEHIND THE SCENES

NEWS AND NOTES OF THE ZOOLOGICAL PARK, THE AQUARIUM AND THE DEPARTMENT OF TROPICAL RESEARCH

The Cubs Are Growing Fast

September weights of the four Tiger cubs, born on May 1, indicate that they are growing rapidly. Sira and Gingi, the two females, weigh 42 and 35 pounds, respectively, and the two males are even heavier — Wadi, 44 pounds; Souja, 45 pounds. There is no mystery about their growth: they get about four pounds of horsemeat a day, and ordinarily consume it all. The cubs were removed from their mother, Dacca, in mid-August.

* * *

Two pairs of Blackfoot X Humboldt Penguins in the Penguin Pool have laid eggs and are incubating them. They should hatch early in October.

* * *

Our Old Okapi Is Gone

Our old Okapi, the first one in the United States and the only one until we received a second male specimen from the Cordier expedition in 1949, has been increasingly crippled by arthritis and finally had to be destroyed on September 5. At the time of its arrival on August 3, 1937, it was believed to have been born in the fall of 1935, which would make it about 17 years old, and with a life span in the Zoological Park of nearly fifteen years.

An Okapi in the Rotterdam Zoo holds the longevity record, having lived for more than 16 years in that zoo.

Wilson's Bird of Paradise Is on Exhibition

A male Wilson's Bird of Paradise, the first we have exhibited since 1926, came into the collection at the end of August. It is one of the most beautiful of the smaller Birds of Paradise.

Small but heavy-bodied, it is about the size of a Starling. It has an electric-blue patch of bare skin on top of its head, a glistening green breast-shield, a bright yellow patch on its upper back, and a deep red back. Two curled, ornamental plumes project from the tail.

The bird came to us from Rotterdam Zoo on August 29 and went on exhibition on September

8. It is shy and nervous, but seems to be settling down well.

Currently the accepted name for Wilson's Bird of Paradise is *Diphyllodes respublica* (Bonaparte), and the name actually has more history than the bird. Little is known about the species except that it is apparently confined to the islands of Waigeu and Batanta off the coast of

Wilson's Bird of Paradise

New Guinea, and lives in the lowlands near the sea. Prince Bonaparte, nephew of Napoleon and a celebrated ornithologist in his day, happened to see a skin of the bird which had been purchased in Europe and was on its way to the Academy of Natural Sciences of Philadelphia. The Prince was so charmed by it that he talked about it before the Academy of Sciences in Paris in 1849 — in the midst of a discussion of parrots — and bestowed a technical name on it. Bonaparte called the species *respublica* for the new Republic of France, although as he commented somewhat bitterly, the ambitions of the republicans in France were making the Republic a hell instead of a paradise.

Subsequently the skin arrived in Philadelphia and was named for Edward Wilson, who had obtained the skin in Europe — the Philadelphians not knowing that Bonaparte had already given it a name.

There was still another naming by an ornithologist who obtained his specimen in its native home, each worker being unaware of previous work, and the taxonomy has a long and involved history. Today Bonaparte's scientific name is accepted, although the common name after Wilson is generally used.

Little Fish

(*Continued from Page* 150)

I tested the water in which they lived and found that it was 76° F. The temperature in the guest house often was 90° F.; outside it was close to 100° F., sometimes more than that.

I placed the glass covered jar in the shower stall, covered it with a cloth and turned the faucet so that a constant drip of water kept the cloth wet. The evaporation process cooled the cloth and this coolness air-conditioned the fruit-jar home of the swordtails. They, together with other live fish collections made along the northern coastal plains of Honduras as far east as Belfate, were flown successfully to our laboratory in New York.

I was unable to find platyfish in Honduras and this convinces me that this species' southernmost habitat must lie somewhere north of the Honduras - Guatemala border. As the records stand now, this expedition of the New York Aquarium, and those made in previous years, have established the northern and southern world limits of the platyfish and swordtail. For the platyfish the southern limit is the Belize River in British Honduras. For the swordtail it is about 20 miles east of Ceiba in Honduras, but the fish may reach Nicaragua. The swordtail is not only found further south than the platyfish, but also further north, for we caught them in the Río Nautla in Mexico. The northernmost limits of the platyfish is the Río Jamapa in the same country.

It is now about a year since the Honduran swordtails were taken from their jungle streams for study in the Genetics Laboratory. They have thrived. Their young have borne young of their own.

This is what we have found out about the rare spotted swordtail so far. The large black pigment cells are inherited through a dominant gene, but unlike the potentially cancerous black cells of the platyfish, those of the swordtail are models of good behavior.

Our tests are by no means over. If we find that the large black pigment cell of the swordtail retains its normal habit of growth under a variety of conditions, we will then have a "standard cell" with which to compare the apparently similar but dangerous pigment cell of the platyfish. This gives focus to the point that two cells may look alike but may differ greatly in their potentialities for good or evil. Our job is to determine what part heredity plays in influencing the vital and irrevocable changes that take place when apparently normal cells become cancerous ones. The scientific news is getting around that there is no better living tool for the study of the underlying causes of black cancers than the swordtails and platyfishes.

PUBLICATIONS OF INTEREST

KING SOLOMON'S RING. By Konrad Z. Lorenz. With a foreword by Julian Huxley and sketches by the author. Pp. xix + 202. Thomas Y. Crowell Co., N. Y., 1952. Price $3.50.

When "Der Kumpan in der Umwelt des Vogels" (The Companion in the Bird World) appeared in 1935, its author, Dr. Konrad Lorenz, was immediately recognized as a new leader in the field of animal behavior. Stemming from his impetus and stimulated by a lecture illustrated with films depicting his now famous Gray-lag Geese, given before the International Ornithological Congress at Rouen in 1938, a whole new school of naturalistic behavior researchers has arisen. Even English translations of Dr. Lorenz's works are not easily assimilated and are far from the order of fireside reading.

That the man who wrote "The Companion in the Bird World" could also have written a book so completely charming, revealing and informative as "King Solomon's Ring" is almost incredible. The explanation of this apparent paradox is found in the reading. Dr. Lorenz has a deep feeling for animals as such and his scientific explorations of their natures has sprung from this underlying foundation.

The result is a book that gives full rein to the varied indulgences of a lover of animals, allows for a certain amount of sentimentality and introduces, throughout, so much factual and interpretive material as to avoid the common pitfalls of anthropomorphism.

This latter point does seem to require further elaboration here. In present-day behavioristic thinking, the fear of anthropomorphism has raised an almost insurmountable barrier to progress. The interpretations of Lorenz push these barriers so far beyond our generally accepted horizons that they open entirely new fields to those who accept them. One of the great difficulties lies in paucity of terms and the use of "husband" and "wife" has implications abhorrent to those who hew close to the line. It is necessary to read the book through attentively to make certain that the use of such words is fully understood from the viewpoint of Lorenz.

The book is replete with humor and really delightful descriptions of innumerable incidents. The assistant who inadvertently addressed "goose talk" to ducklings and automatically begged their pardons and the author's aged father whose invited guests, a flock of Gray-lag Geese, indiscreetly spotted the rug beyond recall, provide anecdotal material of special excellence.

The early chapters of the book are really introductory, since they build up slowly to an intricate account of a colony of Jackdaws, the real heart of the matter. Descriptions of the behavior of fishes are fascinating, even though aquarium experts may take exception to Dr. Lorenz's explanation of the factors of "balance." The chapter on Shrews is a really useful contribution to the ways of these little known animals. The advice given in "Buying Animals" certainly will not receive general approval but under the heading, "The Covenant," will be found a dissertation on the nature of the dog, so discriminating and so incisive that it will satisfy the most demanding, whether or not he accepts the author's statements concerning breed origins.

"King Solomon's Ring" does, indeed, shed "New Light on Animal Ways." Most of all and for the first time, it presents in assimilable and authentic form, the fruits of extensive research in animal behavior. L.S.C.

WANDERING ALBATROSS. Adventures among the Albatrosses and Petrels in the Southern Ocean. By L. Harrison Matthews. Illustrated by line drawings and 21 photographs by the author. 131 + x pp. MacGibbon and Kee with Reinhardt and Evans, London, 1951. $3.

At first glance, Wandering Albatross appears to be a salty and rollicking account of adventures aboard a sealing vessel in the southern seas. But little reading is required for the discovery that this mildly ribald mask is a thin disguise for a really fascinating account of the little-known sea birds of that area, with special attention to those of South Georgia. The habits of Albatrosses, Petrels, Sheath-bills, Skuas and even the Gentoo Penguin are described with the sympathetic interest one expects from the Scientific Director of the London Zoo. Interpolated accounts of the sealer's crew give a sense of realism too often lacking in books of natural history.

—L.S.C.

SPIKE: The Story of a Whitetail Deer. By Robert M. McClung, 64 pp., illus. by author. William Morrow & Co., New York, 1952. $2.00.

A few yards from the Administration Building of the Bronx Zoo there is a flourishing herd of white-tail deer which annually produces a dozen or so fawns. Mr. McClung, the author of "Spike: the Story of a Whitetail Deer," is Acting Curator of Mammals and Birds at the Zoological Park, and the fawns, does and bucks of the Zoo herd are under his charge. He is not, therefore, writing about the lives of such creatures merely as one who has dredged his facts from books. "Spike" is a simple story of the little and big adventures in the life of a white-tail fawn from the spring of its birth to the following spring when, as a spike buck, or yearling, it begins life on its own. A rattlesnake, hunters, a forest fire, are the only excitements and they are not overly-dramatized. The story is quiet, balanced, accurate and informative, well calculated to interest a small child and a worthy companion to Mr. McClung's other books on a Chipmunk, a Sphinx Moth and a Ruby-throat Hummingbird.

OUR AMAZING BIRDS. By Robert S. Lemmon. 102 illus. in black-and-white by Don R. Eckelberry. 239 pp. The American Garden Guild and Doubleday & Co., Inc., Garden City, N. Y., 1952. $3.95.

In this group of brief essays, Mr. Lemmon has outlined the life histories of 99 species of contemporary native American birds, as well as three others – the Great Auk, the Passenger Pigeon and the Carolina Parrakeet – which have already passed into extinction. The essays are well done in popular and readable style and will be most stimulating to casual or budding interests in bird lore. Mr. Eckelberry's drawings are very good indeed, and add much to this attractive volume. It is no aspersion of the artist's skill to suggest the probability that few male Ruby-throats enjoy such close inspection of their offspring as the bird shown in the frontispiece. – L.S.C.

BIRDS AND THEIR NESTS. By Olive L. Earle. 64 pp., illus. by author. William Morrow & Co., New York, 1952. $2.00.

Somewhat older children will like Miss Earle's "Birds and Their Nests" and if children use reference books, this is an excellent one for the child's library. The nests and nesting habits and some of the more usually sought information about 42 birds is set down concisely, alongside Miss Earle's drawings of the birds and their nests. Without attempting to be a guide or identification manual for nests – there are several such books – it covers quite a number of the unusual nests of native and foreign birds, including the Giant Oriole, or Oropendola; the Hoatzin and the King Penguin – the latter not a nest-builder at all, but certainly unusual enough to be included, for it incubates its egg by carrying it on top of its feet, covered by a fold of skin.

FRESHWATER TROPICAL AQUARIUM FISHES. By G. F. Hervey & Jack Hems. Pp. xiv + 425, illus. Published by Batchworth Press Ltd., London, 1952. British Book Center, New York. $8.50.

Small aquarium fishes are still increasing in popularity, and with this increase goes an increased demand for information about them.

The most recent attempt to supply this information is an ambitious work from England, where there seem to be more fanciers, proportionately, than there are here.

The authors have considerable practical knowledge of fish-keeping, which they manage to convey very well, and some experience with a great many species – apparently not all that are treated in the book, some five hundred odd – which they are willing to share, and their discussions of tank management, fish sicknesses, plants and other tank furnishings, and even salt water tanks, are satisfactory from a practical standpoint. Their knowledge of the theory behind the operation of the fish tank, their taxonomy, and even of such commonplaces, nowadays, as the use of the new drugs for the treatment of disease, is not quite as sound.

As a contribution to the lay literature, however, the book is definitely important.

There are adequate indices, but the illustrations are poor, not up to what we had learned to expect from their previous efforts on goldfish. – C.W.C.

THE DUSKY-FOOTED WOOD RAT. By Jean M. Linsdale and Lloyd P. Tevis, Jr. Numerous photographs, charts and tables. Pp. vii + 664. University of California Press, Berkeley and Los Angeles, 1951. Price $7.50.

In this weighty volume are set forth the results of ten years of observation of the ways of this small rodent. Besides the authors, a total of twenty-one other workers at the Hastings Natural History Reservation of the University of California have contributed data of one sort or another.

Technical in content, the book is not noteworthy for readability. Both data and photographs are extensive and sometimes repetitious but the contents in general will be invaluable to workers with this species, in any aspect. Factually, there must remain little more to be said concerning the Dusky-footed Wood Rat. – L.S.C.

New Members of the New York Zoological Society

Between July 1 and August 30, 1952

Life

Amos B. Miller

Contributing

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Andrew R. Butler
Mrs. Joseph Campbell
Kerryn King
Mrs. Edward T. Levitt
Mrs. Shelton E. Martin
Dr. Herbert S. Ogden
Harold T. White, Jr.

Annual

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Diego Muniz Barreto
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Robert A. Snyder
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Mrs. Shirley Towbis
Paul C. Wilson
Stanley Wysong

CANDY

Goes Right After What She Wants

Our new baby Elephant, Candy, is a direct actionist. She is only a little over a year old, but already she has learned to stick her infant trunk straight out for refreshments — just like a big Elephant.

Sometimes we wish *we* had an appealing proboscis like Candy's. We would use it to plead for new members for the Zoological Society. Perhaps in time we can train Candy to beg you for the names and addresses of those friends of yours who ought to join the Society.

Smart as she is, we think it will take some time for Candy to graduate from cadging for popcorn to this higher form of salesmanship. So in the meanwhile, won't you please use the card enclosed with this magazine to send us some names? Candy has enough charm to beguile many more people, so come to see her soon.

MEMBERSHIP CHAIRMAN
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OCT 1 0 1952